For the off-site disposal alternative, where pile consolidation time is not a factor, project completion dates under the truck and rail transportation options could be affected by work schedules. Consequently, for these two modes of transportation, DOE considered two work schedules. The single-shift schedule would be one 12-hour shift, 7:00 a.m. to 7:30 p.m., 50 weeks per year. The double-shift schedule would be two 10-hour shifts, 7:00 a.m. to 5:30 p.m. and 5:30 p.m. to 4:00 a.m., 50 weeks per year. These two schedules were considered to allow flexibility in targeting a project completion date. In this EIS, impacts are generally assessed assuming the more aggressive double-shift schedule is implemented. This was done to ensure that certain impacts unique to the double-shift were addressed. For example, night operations under a double shift could entail impacts to night sky vision, noise, and traffic that would not be considerations under a single-shift scenario. The NPS has expressed concern for these factors in relation to Arches National Park. The one difference in these schedules would be that for truck transportation the schedules would run 7 days per week, and for rail transportation the schedules would run only 6 days per week. This difference would be necessary to accommodate railroad requirements that stipulate 1 day per week be allowed for locomotive and track maintenance.

DOE considered only one schedule for the pipeline transportation option because once pumping operations began they would be in progress 24 hours a day. Processed slurry would be stockpiled, and the factor driving the schedule for project completion would be the diameter of the pipe rather than the number of workers excavating the pile. DOE selected the pipe diameter to allow for a schedule roughly the same as the rail and truck transportation single-shift work schedule that estimates project completion in 2012.

Figure 2–10, Figure 2–11, and Figure 2–12 illustrate the estimated schedules for completing the surface remediation activities for the off-site disposal alternative using the three transportation modes. As seen in the figures, the schedules would be similar for all three modes of transportation. Assuming that a ROD is issued in 2005 and that a single-shift work schedule is implemented for truck or rail transportation, remediation work would begin in late 2007 and would be completed in 2012 for all three modes of transportation, regardless of the off-site disposal cell location. This is similar to the schedule that would apply for the on-site disposal alternative if the more aggressive 1-year top slope cover construction schedule were used (see Figure 2–4). However, as shown in Figure 2–10 and Figure 2–11, use of a more aggressive double-shift work schedule for the truck or rail transportation modes would expedite completion of the surface remediation activities by approximately 2 years and result in completion of the surface remediation activities in late 2010 or early 2011. The 2-year schedule uncertainty for pile consolidation discussed in Section 2.1 for the on-site disposal alternative would not apply for the off-site disposal alternative.

2.2.1 Construction and Operations at the Moab Site

This section describes construction and operations at the Moab site under the off-site disposal alternative. Ground water remediation at the Moab site is discussed in Section 2.3. The following subsections address three elements: (1) site preparation, infrastructure enhancement, and control, (2) excavation and processing of tailings and other contaminated material, and (3) Moab site reclamation. Figure 2–13 is a Moab site plan illustrating the major site features and approximate locations of temporary on-site areas and facilities that would be used under the off-site disposal alternative.

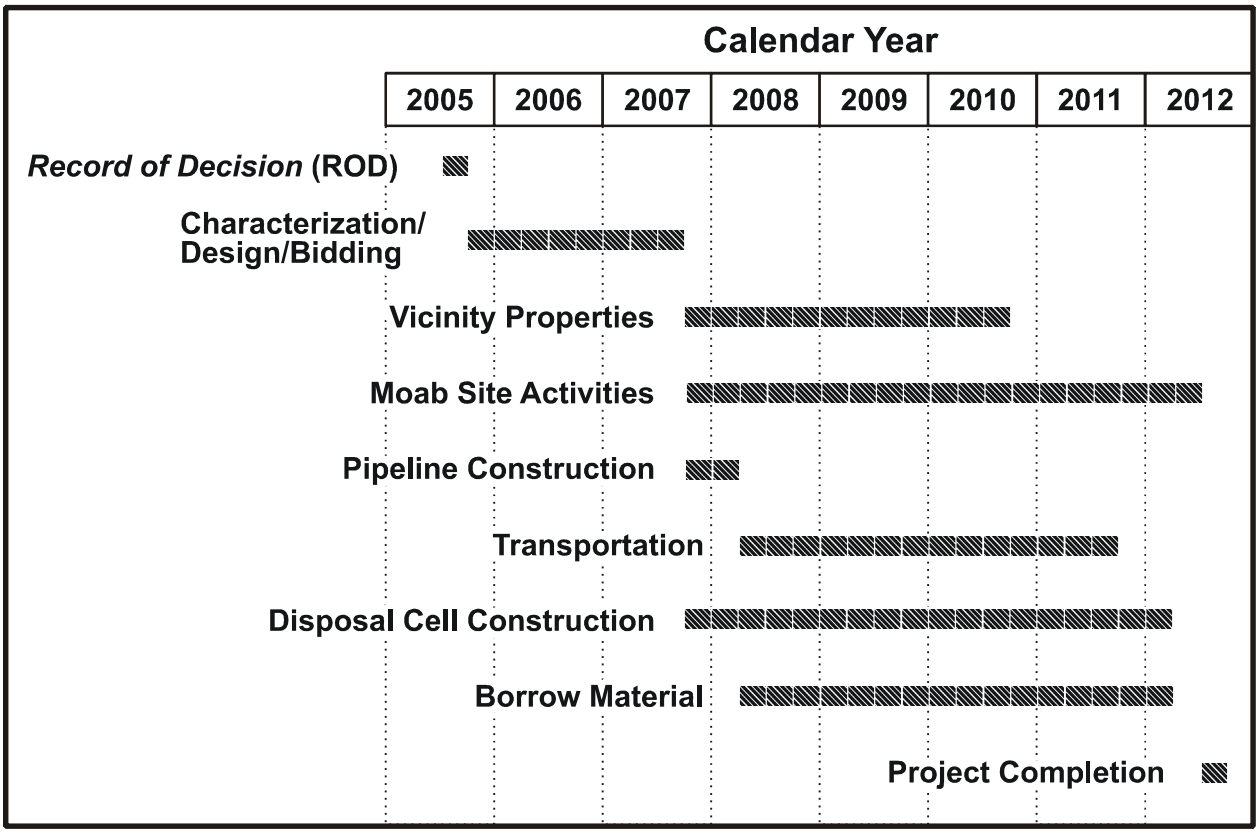

Figure 2–12. Slurry Line Haul Off-Site Disposal Alternative, Surface Remediation Activity Schedule

2.2.1.1 Site Preparation, Infrastructure Enhancement, and Controls

Many aspects of the Moab site preparation, infrastructure enhancement, and controls would be similar to those described in Section 2.1.1.1 for the on-site disposal alternative. The major differences would be associated with the temporary transportation infrastructure, access roads, and vicinity property material storage that would be required for the off-site disposal alternative. As with the on-site disposal alternative, in all instances, new structures or other installed elements would be painted a color to match background soils and/or vegetation in order to minimize visual impacts seen from US-191 or SR-279.

Activities that would be similar or identical to those described in Section 2.1.1.1 include

- Storm water management.
- Dust control.
- Water pumping station enhancements.
- Temporary field offices and staging areas.
- Vehicle maintenance and fuel storage areas.

Temporary Transportation Facilities

Temporary facilities would be necessary to support whichever transportation mode was selected. If the truck option were selected, highway access consisting of an overpass and acceleration and deceleration lanes would be required. If the rail option were selected, a railroad spur and a conveyor system to convey tailings to the railroad cars would be required. If the slurry pipeline option were selected, a pumping station with associated material preparation items would be required. More detailed descriptions of the required temporary transportation facilities that would be constructed at the Moab site are included in Section 2.2.4.

New Access Roads

The existing access road to the Moab site is adequate for only a limited volume of traffic. Construction of approximately 1,000 ft of new access roads to accommodate the added volume of traffic would be required for the off-site disposal alternative. New access roads would be 30 ft wide and gravel-surfaced; therefore, they would not require regular dust control measures. Section 2.2.4 describes the required new or upgraded access roads in greater detail.

Vicinity Property Storage Area

Vicinity property remediation is discussed in Section 2.1.2. Prior to being transported for final disposal, contaminated materials from vicinity properties would be delivered to the Moab site for sizing and processing. These materials would be stored in a vicinity property storage area until ready for processing or transportation.

Radiological Controls

The radiological controls at the Moab site would be structurally and functionally similar to those described in Section 2.1.1.1. One modular trailer would control personnel access to contamination areas. For the truck transportation option, two vehicle/equipment decontamination stations would be constructed: one for vicinity property haul trucks, and a larger one with three to four bays for decontaminating tailings haul trucks. The final size and layout of the facility would reflect the expected volume of truck traffic. For the rail or pipeline options, a single vehicle/equipment decontamination facility would be constructed.

2.2.1.2 Excavation and Preparation of Tailings for Transportation

This section describes the actions that would be necessary at the Moab site to prepare, excavate, and process contaminated material for transportation to an off-site location. This discussion addresses activities up to the time when contaminated materials are loaded into trucks for highway transportation (truck haul transportation alternative) or into the conveyor hopper (rail transportation alternative). The material preparations for truck or rail transport would differ from those for slurry pipeline transport.

Preparation for Truck and Rail Transportation

Before it could be transported by truck or rail, the material in the tailings pile would have to be excavated and dried to a specified moisture content by drying in a process bed and mixing with drier material. To accomplish this, approximately 32 acres at the northwest and east base of the pile and an additional 14 acres around the top perimeter of the pile would be used as drying or

processing areas. These areas (see Figure 2–13) would be accessed by temporary haul roads. There would be approximately seven separate 6- to 7-acre process beds in the areas. DOE has previous experience successfully moving wet tailings, including saturated slimes, at other UMTRCA sites such as at the Riverton (Wyoming), Rifle (Colorado), Monument Valley (Arizona), and Grand Junction (Colorado) sites.

Once the process beds and haul roads were constructed, pile excavation would begin. An excavating machine located on the perimeter of the pile would excavate from the center of the pile outward. The excavating machine would drag slimes from the center and pull them over and into the perimeter sands, providing some mixing during the excavation. The coarser tailings sands at the outer perimeter of the pile would be excavated and moved to the process beds using scrapers. This method would allow a progressive top-down excavation sequence that would maintain the stability of the perimeter tailings dike surrounding slimes and also allow continuous use of the perimeter area material for processing.

As saturated slimes were excavated from the center of the pile, the material would be loaded onto trucks and taken to the process beds for mixing and drying. A tractor would turn and dry the graded material until it reached a consistent moisture content suitable for truck or rail transport. Assuming dry tailings were available for mixing with wet tailings, the mixing and drying process for a load of excavated material would take approximately 3 days; if dry tailings were not available for mixing, the material would be processed for 7 days prior to shipment. The approximate maximum daily volume of material that could be placed for processing would be 15,500 yd^3 in each process bed of approximately 6 to 7 acres. Should tailings drying take additional time, slightly greater areas for drying would be necessary to allow sufficient inventory of tailings to be dried and transported according to the planned schedule.

Once the material was sufficiently dry, it would be loaded onto 22-ton tandem trucks (total 44 tons) for off-site shipment if the truck transportation mode were implemented. Alternatively, if rail transport were implemented, the dried material would be transported by a conveyor system and loaded onto waiting gondola cars. After excavation of the pile reached the assumed original grade, it would continue until the cleanup criterion had been met. On the basis of limited existing data, DOE estimates that subpile excavation to a depth of 2 ft would be required.

Preparation for Slurry Pipeline Transportation

Although pile excavation for the slurry pipeline transportation alternative would occur in the same manner as for truck or rail transportation, post-excavation processing would be different because the pipeline mode of transportation would require that the materials be mixed with significant amounts of water to form a slurry. As tailings were excavated, off-highway haul trucks would be loaded at the point of excavation and would deliver the material to a temporary stockpile near the slurry processing area. The material would be screened to separate greater-than-4-inch material from less-than-4-inch material. The larger material, or debris, would be stockpiled for highway truck haul to the disposal cell. Loaders would then deliver the smaller material to slurry process hoppers. Section 2.2.4.3 discusses the slurry pipeline transportation process.

Demolition and Disposal of Existing Mill Facilities

The existing mill facilities would be demolished and disposed of in a manner similar to that described in Section 2.1.1.2, with the exception that demolished material would be stockpiled, sized, and transported to the selected off-site disposal cell rather than deposited in the on-site disposal cell for permanent disposal. For the slurry pipeline and rail transportation alternatives, the demolished materials would be transported by truck.

2.2.1.3 Moab Site Closure

Site reclamation actions would be similar to those described under the on-site disposal alternative (Section 2.1.1.4). However, an additional 130 acres of reclamation would be required at the Moab site under this alternative due to removal of the tailings pile. Potential future uses of the site would be a more significant factor in determining final reclamation actions for the off-site disposal alternative because the pile would be removed. Once all contaminated material was removed from the Moab site, closure would begin and would involve two phases: (1) removal of temporary facilities, and (2) final site reclamation.

Removal of Temporary Construction Facilities

The temporary facilities described under Section 2.2.1.1, as well as concrete slabs, piping, sewage holding tanks, and pond liners, would be removed from the site in accordance with a waste management plan that complied with all applicable federal and state regulations. Wherever possible, materials would be salvaged for reuse at other sites. Unsalvageable materials would be disposed of in the off-site disposal cell, at another licensed facility, or as municipal waste, as appropriate.

Final Site Reclamation

As discussed in Section 1.4.5, release of portions of the site for future uses would depend on the success of site remediation. DOE's ultimate goal would be to remediate to unrestricted surface use standards. However, DOE would defer its decisions on the release and future use of the Moab site pending an evaluation of the success of surface and ground water remediation. Some fencing would be required at least for the 75 years during which ground water remediation would be ongoing. Before backfill and site reclamation and following the removal of the temporary infrastructure, structures, and controls, DOE's contractor would verify that radium-226 concentrations in soil within the Moab site boundary did not exceed EPA standards in 40 CFR 192. The entire site would then be graded and recontoured. The water storage ponds would be backfilled to original grades prior to reclamation. Approximately 425,000 yd^3 of fine-grained silty- to sandy-loam reclamation soil excavated from the Floy Wash borrow area would be imported as backfill for the Moab site. Soils would be prepared for planting by scarifying with a disk harrow. Moisture conditioning would be performed and the area seeded with native or adapted plant species.

Moab Wash would be reconstructed in its general present alignment. After removal of the tailings impoundment and contaminated soils, site topography and future land use are uncertain. Thus, to minimize costs and achieve fluvial stability, the channel would be reestablished in its current location. Additional meanders may be added to increase travel distance of the water and reduce slope to mitigate future erosion caused by higher water flow velocity. The channel would be lined with riprap and designed to carry the estimated runoff volume for a 200-year flood. Larger flows would be allowed to flood into channel overbank areas.

2.2.2 Characterization and Remediation of Vicinity Properties

Characterization and remediation of vicinity properties would be completed as described in Section 2.1.2. The primary difference between the on-site and off-site disposal alternatives with regard to vicinity properties would be the requirement to transport the stockpiled material to an off-site disposal location.

2.2.3 Construction and Operations at Borrow Areas

Descriptions of borrow material site locations, standards, and excavation procedures are the same as those described in Section 2.1.3. However, borrow material traffic density and routing would differ from those described in Section 2.1.3.2 because, with the exception of the Moab site reclamation soil, the borrow materials would be delivered to, or be available at, the selected off-site disposal location.

Transport Truck Traffic Density

As shown in Table 2–7, assuming implementation of a double work shift (for truck or rail haul) DOE estimates that the transport of borrow materials would require a total of 67 daily round-trips for the Klondike Flats off-site disposal alternative and 24 for the Crescent Junction or the White Mesa Mill alternative. (For the slurry pipeline mode, average daily round-trips would be about 30 percent less than those shown in Table 2–7 because of the longer overall schedule for borrow material activities.) Under a double work shift schedule, borrow material transportation would be ongoing for approximately 2.75 years (875 days) for the truck or rail transportation mode (see Figure 2–10 and Figure 2–11). For the slurry pipeline mode, borrow material activities would be ongoing for about 4 years (Figure 2–12). Table 2–7 also shows the total volume and total shipments for each of the five types of borrow materials.

If a single daily work shift schedule were implemented for the truck or rail transportation modes, borrow material transportation would be ongoing for approximately 3.75 years, and the estimated daily round-trips would decrease to approximately two-thirds of the numbers shown in Table 2–7. As shown in Table 2–1, there are several optional borrow areas for obtaining cover soil. Table 2–7 assumes that all cover soil would come from the Floy Wash borrow area (as would all Moab site reclamation soil). This option would generate the most traffic on public highways.